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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-----------------------------------|-----------------------------|
| 10/728,490 | 12/05/2003 | Mark T. Anderson | 58623US002 | 9748 |
| 32692 7590 05/07/2007 3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427 | | | EXAMINER CHACKO DAVIS, DABORAH | |
| | | | ART UNIT 1756 | PAPER NUMBER |
| | | | NOTIFICATION DATE 05/07/2007 | DELIVERY MODE ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

LegalUSDocketing@mmm.com
LegalDocketing@mmm.com

Office Action Summary

Application No.

10/728,490

Applicant(s)

ANDERSON ET AL.

Examiner

Daborah Chacko-Davis

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1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/06.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-27, and 36-38, are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 2004/0012872 (Fleming et al., hereinafter referred to as Fleming).

Fleming, in the abstract, in [0019], [0020], [0021], [0022], [0027], [0060], [0076], [0188], discloses a method of providing a photoreactive composition that is substantially inorganic, exposing the photoreactive composition to a multibeam exposure process (multi beam of at least four beams, and multiphoton reactive radiation, pulsed IR laser) so as to form reacted and non-reacted portions of the photoreactive composition to form a three-dimensional pattern (of exposed and unexposed areas), developing the photoreactive composition (remove reacted portions or non-reacted portions, remove exposed or unexposed areas with a solvent or chemical etching) to form a periodic pattern (interstitial void space of submicron dimensions) (claims 1-3, 8, 23-27, 36, and 38). Fleming, in [0179], discloses that the photoreactive composition is further subjected to heating, causing the facilitation of dissolution of certain components and

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the dissipation of volatile components and therefore losses less than 60 percent of the its initial weight (upon irradiation and heating) (claims 5, and 37). Fleming, in [0028], and [0074], discloses that the photoreactive composition includes reactive species such as curable organic species, a photoinitiator, and inorganic particles such as siloxanes (claims 4, 6-7). Fleming, in [0028], [0108], [0124], [0134], discloses a photoinitiator that includes a multiphoton photosensitizer, an electron donors such as amines, and electron acceptors such as iodonium salts or triazines (claims 9-10, and 15-16). Fleming, in [0099], discloses that the photon absorption of the multi-photon photosensitizer is greater than that of the fluorescein (claim 11-12). Fleming, in [0110], discloses that the multi-photon photosensitizer (with a large multi-photon absorption cross-section) in the photoreactive composition is Rhodamine B (claims 13-14). Fleming, in [0134], discloses that the photoreactive composition includes metal fluorides (metal complexes such as oxides) that are later irradiated during exposure (claims 17-22).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 28-35, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 2004/0012872 (Fleming et al., hereinafter referred to as Fleming) in

view of U. S. Patent Application Publication No. 2004/0198582 (Borrelli et al., hereinafter referred to as Borrelli).

Fleming is discussed in paragraph no. 2.

Fleming, in [0021], [0022], [0027], [0060], [0076], [0188], discloses removing reacted or unreacted (or both) portions of the photoreactive composition after exposure processes by developing or etching (claims 30-31).

The difference between the claims and Fleming is that Fleming does not disclose that the three-dimensional structures (interstitial voids) formed are deposited with a semiconductor material as recited in claims 28, 29, 32-35).

Borrelli, in [0040], discloses that the three-dimensional gratings are filled with silica (different refractive index than the grating) and then surface treated by heating in a furnace.

Therefore, it would be obvious to a skilled artisan to modify Fleming by employing the method of depositing the claimed material on the gratings as suggested by Borrelli, because Fleming, in [0002], discloses that the three-dimensional patterns (gratings) are formed using the multi-photon method, and Borrelli, in [0008], teaches using the method for forming glass based optical elements that has desired refractive index material in the voids (pattern grooves).

Response to Arguments

5. Applicant's arguments filed February 2, 2007, have been fully considered but they are not persuasive. The 102 and 103 rejections made in the previous office action (paper no. 20061002) are maintained.

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A) Applicants argue that Fleming does not teach a substantially inorganic photoreactive composition.

Fleming discloses a photoreactive composition that includes electron donor compounds that include ammonium salts and photoinitiators such as metal complex salts (see paragraph nos. [0124], and [0134]).

B) Applicants argue that Fleming does not teach a substantially inorganic photoreactive composition, that upon photoreaction and pyrolysis, loses less than 80 percent of its initial weight.

See paragraph no. A. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., upon photoreaction and pyrolysis loses less than about 80 percent of its initial weight) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

C) Applicants argue that Fleming does not suggest the use of multi-beam interference technique to expose a substantially inorganic photoreactive composition.

See paragraph no. A. Fleming in [0022], discloses that the photoreactive composition is exposed in an exposure system using optical interference from the three or more light beams i.e., the photoreactive composition is exposed via multi-beam interference (MBI technique).

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D) Applicants argue that Fleming does not teach a development step or a removal step.

Fleming in [0060] discloses that once the patterns of interference of coherent light is formed, the desired surface profile is formed either by etching or using a composition that is a developable photopolymer (i.e., after exposure it undergoes development), or through laser ablation (removal of undesired portions).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's

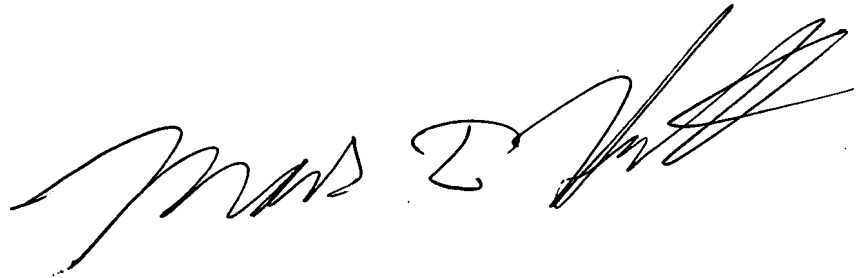
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supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd

April 24, 2007.

A handwritten signature in black ink, appearing to read 'Mark F. Huff', with a stylized flourish at the end.

**MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700**